Pixel Failure Modes - Local

*DOCDB 404-**v1*** *PIXEL FAILURE MODES* *Lucien Cremaldi* *06 Sep 2005*

Problem (Local)	Siemens T / %H	FEC/DCU Temp	FED Temp/Rate	Chiller Plant Flow/Wght	CAEN ΔI-Current	GC/MS %Gas
6-U cooling loop failure (small leak)	ΔT<2	ΔT<2	ΔT<2	0	0	**%FC**
6-U cooling loop failure (large leak/break/blocked)	**ΔT>50**	**ΔT>50**	ΔT>50	0	0	%FC
Supply line failure (small leak)	ΔT<2	ΔT<2	ΔT<2	0	0	**%FC**
Supply line failure (large leak/break/blocked)	**ΔT>50**	**ΔT>50**	ΔT>50	FLOW	ΔI	%FC
Poor contact between frame and pipe.	**ΔT<2**	**ΔT<2**	ΔT<2	0	0	
%Humidity increase	**%H**	0	0	0	0	%H2O
Local HV/LV Dead Short	ΔT	ΔT	ΔT	0	ΔI	0
Local HV/LV Leakage Current High	ΔT	ΔT	ΔT	0	ΔI	
Excessive Plaquette Vibration	Accelerometer					
Noise/Grounding Loop			RATE		ΔI	

Pixel Failure Modes - Global

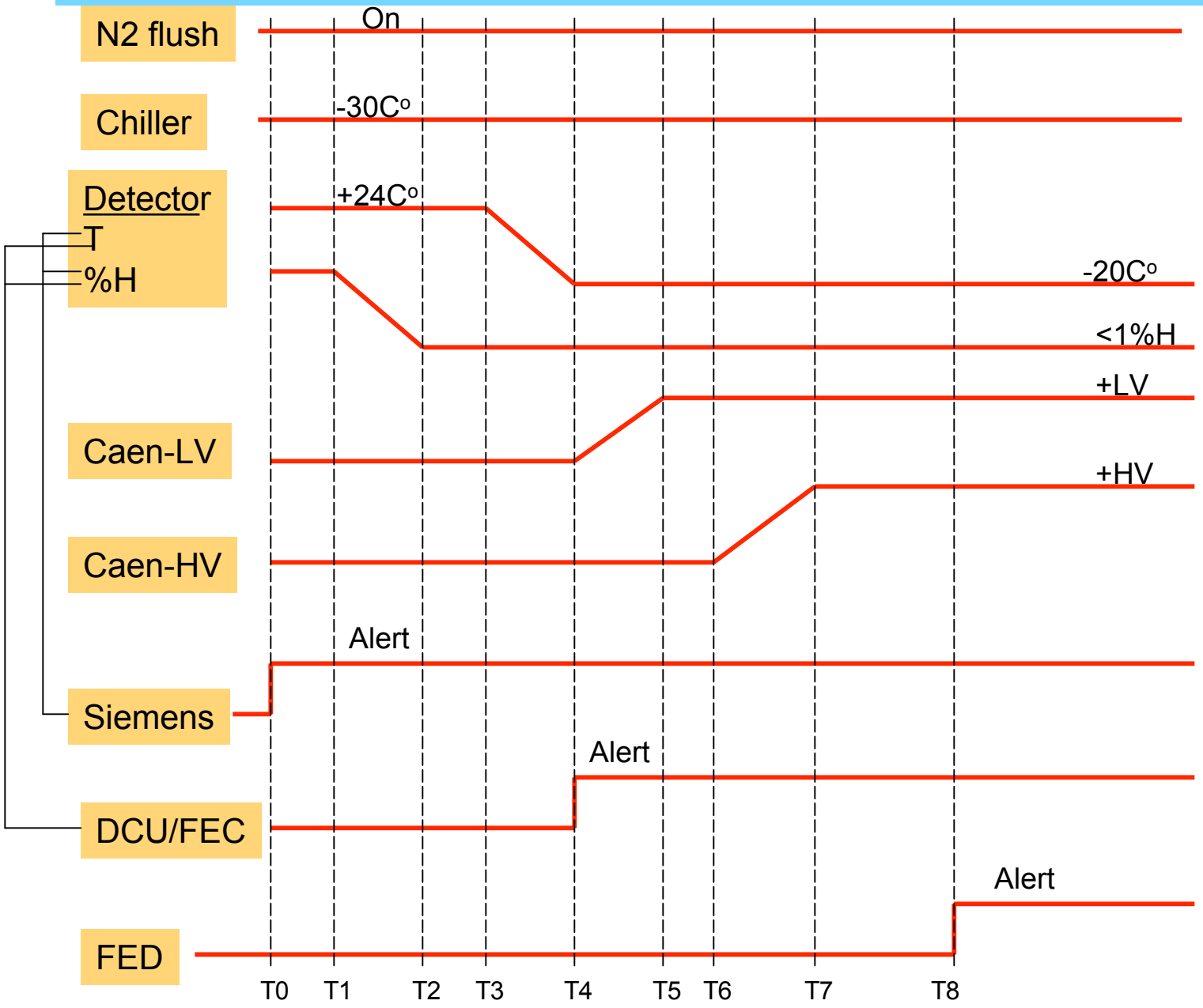
Problem (Global)	Siemens T / %H	FEC/DCU Temp	FED Temp/Rate	Chiller Flow/Wght	ΔI-Current	GC/MS %Gas
Si Tracker - Thermal screen Off or Failure	**ΔT<2**	**ΔT<2**	**ΔT<2**	FLOW	ΔI	0
Cooling Plant global failure (stop, major leak)	**ΔT>50**	**ΔT>50**	**ΔT>50**	FLOW	ΔI	0
Major leak in supply lines.	**ΔT>50**	**ΔT>50**	**ΔT>50**	FLOW WGHT	ΔI	0
Minor leak in supply lines.	0	0	0	FLOW	0	0
High radiation level	DOSE	DOSE	0	0	ΔI	0
N2 flow failure (stop flowing, no dry)	0	0	0	0	0	%H2O
Global power cut in the counting room						0
Global power cut in the cavern	**ΔT**	**ΔT**	**0**	**0**	ΔI	0
Siemens PLC failure	PLC	0	0	0	0	0
Coolant radiation damage or impurity pollution.	**ΔT**	**ΔT**	**ΔT**	FC72	ΔI	0

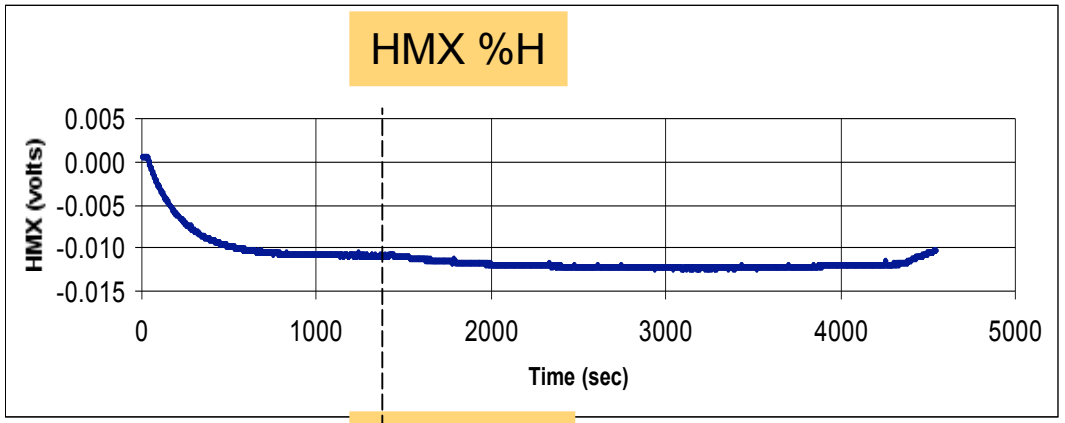
Interface to DCS

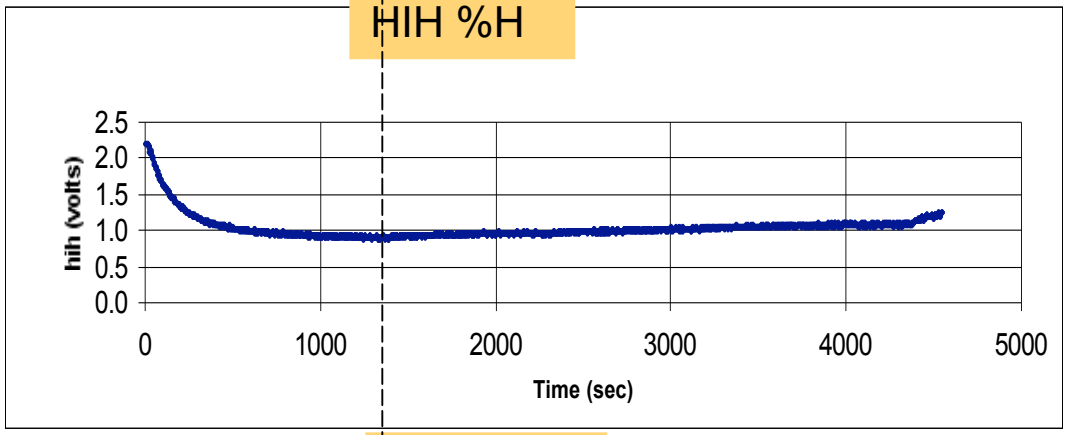
Control Script	SIEMENS T,%H	FEC/DCU T,%H	FED δT, Rates	CAEN *I*	CHILLER Flow/Wght	GAS ANALYSIS
WARM START*	ON-T, %H	ON-T, %H	OFF	OFF	ON-Flow	ON
COLD START	ON-T, %H	ON-T, %H	OFF	OFF	ON-Flow	ON
RUN INIT	ON-T, %H	ON-T, %H	ON	ON - *I*	ON-Flow	ON
DATA RUN	ON-T, %H	ON-T, %H	ON	ON - *I*	ON-Flow	ON
CALIB RUN	ON-T, %H	ON-T, %H	ON	ON - *I*	ON-Flow	ON
END RUN	ON-T, %H	ON-T, %H	ON	ON - *I*	ON-Flow	ON

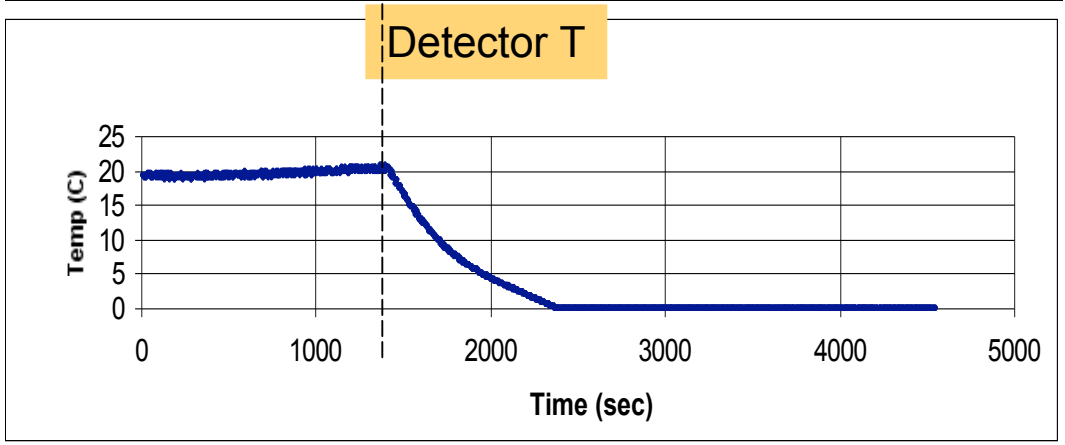
- Control Scripts written by software experts.
- Important input from hardware: TB and R&D experience
- Timing Sequence defined for each.

Interface to DCS (“WarmStart”)




HMX %H
HMX (volts)
0.005
0.000
-0.005
-0.010
-0.015
0
1000
2000
3000
4000
5000
Time (sec)


HIH %H
hih (volts)
2.5
2.0
1.5
1.0
0.5
0.0
0
1000
2000
3000
4000
5000
Time (sec)


Detector T
Temp (C)
25
20
15
10
5
0
0
1000
2000
3000
4000
5000
Time (sec)